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October 8, 1962

Mr. John A. Janous
Industrial Hygiene Engineer
Jones & Laughlin Steel Corporation
3 Gateway Center
Pittsburgh 30, Pennsylvania

Dear Mr. Janous:

I am sorry there has been a delay in my reply to your letter of September 26th in which you requested information concerning our hydrochloric fluid, Pydraul 150. I have been out of town and have just returned to the office.

I will attempt to answer the questions you raised in the order they appear in your letter. In addition, I am requesting that our fluid engineering experts send you additional data and comments since the flash point of fire resistant fluids is not the sole criteria for determining the lack of fire hazard in the use of these materials.

1. The flash point for Pydraul 150 is 425° F., Cleveland Open Cup. The fire point is 465° F., Cleveland Open Cup. It is my understanding that the flash and fire points at these temperatures are the results of breakdown of the fluid rather than being the flash and fire points for the vapors of the fluid itself. Although we do not have complete analytical data as to the composition of breakdown products, I would expect that a major constituent would be carbon monoxide along with phenolics, aldehydes, CO_2 and water, depending on the degree of breakdown.

2. I do not believe that it is possible to develop a situation where explosion would be a hazard.

3. As mentioned in No. 1 above, complete analysis of breakdown products is not available. This is likewise true where there is more complete thermal decomposition which occurs under conditions such as referred to in your letter. In animal toxicity studies where fluids similar

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to 150 were decomposed at 1050° and 1250° F., animals survived exposures which humans would not tolerate because of irritation to the eyes and respiratory tract. Analysis of the chamber indicated the presence of the materials mentioned above. It is true that when the animals were exposed for two or more hours to the decomposition products some failed to survive. The presence of none of the above materials was not sufficiently great to have caused fatalities in the animals had anyone of the products been the sole contaminant. To give some idea of the concentration of decomposition products to which the animals were exposed, it was pointed out that the "smoke" was so dense that vision through the chamber atmosphere was limited to about twelve inches. Animals at the rear of the chamber which was two feet in depth could not be seen.

In a comparison experiment using petroleum base hydrochloric oils, the incidence of mortalities among the animals was nearly as great as with the Pydraul fluid. In the experiments with the petroleum products, the equipment in the experiment had to be modified to prevent the flames from the decomposition from entering the animal chamber.

4. Based on a review of the effects on the animals and reports of humans suffering temporary effects in other instances such as the one you described, symtomatic medical treatment is all that is recommended. Any medication or therapy to releive eye and respiratory tract irritation would be appropriate.

5. I would not expect that any fumes or vapors would develop from the use of Pydraul 150 in motorized equipment.

If after reviewing the above comments and those which will be forwarded by Mr. Dale Smith you have any questions, please do not hesitate to contact me.

Sincerely,

Elmer P. Wheeler
Assistant Director
Medical Department

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